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1 22. (New) The apparatus of claim 21 wherein the signal processor
2 computes common mode and differential mode current and voltage
3 components of the subscriber loop.

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1 23. (New) The apparatus of claim 21 further comprising:
2 a linefeed driver for controlling the subscriber loop in response to the
3 linefeed driver control signals, wherein the linefeed driver does not reside
4 within a same integrated circuit as the signal processor.

1 24. (New) The apparatus of claim 23 wherein the linefeed driver does not
2 compute any common mode subscriber loop voltages or currents, wherein
3 the linefeed driver does not compute any differential mode voltages or
4 currents of the subscriber loop.

1 25. (New) The apparatus of claim 21 wherein the signal processor is a
2 complementary metal oxide semiconductor (CMOS) integrated circuit.

1 26. (New) The apparatus of claim 21 wherein the signal processor operates
2 in a positive voltage range with respect to ground to generate the linefeed
3 driver control signals for controlling a linefeed driver operating at a negative
4 d.c. voltage offset relative to the signal processor, wherein the offset is at least
5 approximately 40 VDC.

1 27. (New) The apparatus of claim 21 wherein the sensed tip signal includes
2 first and second sampled tip voltages, wherein a difference between the first
3 and second sampled tip voltages is proportional to a subscriber loop tip
4 current, wherein the sensed ring signal includes first and second sampled

5 ring voltages, wherein a difference between the first and second sampled ring
6 voltages is proportional to a subscriber loop ring current.

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1 28. (New) The apparatus of claim 23 wherein the linefeed driver further
2 comprises:
3 a tip control circuit; and
4 a ring control circuit, wherein the tip and ring control circuits vary tip
5 and ring node voltages of the subscriber loop in response to the linefeed
6 driver control signals.

1 29. (New) The apparatus of claim 28 wherein the tip and ring control
2 circuits provide d.c. isolation between the signal processor and the subscriber
3 loop.

1 30. (New) The apparatus of claim 28 wherein the tip control circuit further
2 comprises:
3 a first transistor of a first type having an emitter coupled to receive a
4 first tip control signal of the linefeed driver control signals;
5 a second transistor of a first type having an emitter coupled to receive a
6 second tip control signal of the linefeed control signals, wherein a base of the
7 first and second transistors is coupled to a common signal ground node;
8 a third transistor of a second type having a collector coupled to a
9 collector of the first transistor and a tip line of the subscriber loop;
10 a resistor having a first end coupled to the emitter of the third
11 transistor to form a battery feed node, wherein a second end of the resistor
12 coupled to a base of the third transistor and a collector of the second
13 transistor.

1 31. (New) The apparatus of claim 30 wherein the first type is a PNP bipolar
2 junction transistor, wherein the second type is an NPN bipolar junction
3 transistor.

1 32. (New) The apparatus of claim 21 wherein the signal processor performs
2 at least one of the subscriber loop supervisory functions of ring trip, ground
3 key, and off-hook detection.

1 33. (New) The apparatus of claim 21 wherein the signal processor performs
2 subscriber loop ring control, supervision, codec, and hybrid functions.

1 34. (New) The apparatus of claim 21 wherein the signal processor further
2 comprises a programming interface to enable programmatic control of at least
3 one of the following parameters: battery control, battery feed state control,
4 voiceband data amplification, voiceband data level shifting, longitudinal
5 balance, ringing current, ring trip detection threshold, off-hook detection
6 threshold, and audio output signal termination impedance for voiceband
7 communication signals superimposed on the linefeed driver control signals.

1 35. (New) The apparatus of claim 21 wherein the signal processor
2 superimposes outgoing analog voiceband communications on the linefeed
3 driver control signals.

1 36. (New) The apparatus of claim 21 wherein the linefeed driver control
2 signals include separate tip control signals and ring control signals.